

On the Phenomenon of the Transit of the First Satellite of Jupiter 1890 September 8, and Observations of the Red Spots on the Planet. By E. E. Barnard, M.A.

In a letter which I have received from Mr. A. Stanley Williams he informs me that he has sent a communication to the Royal Astronomical Society in which he endeavours to explain the apparent duplicity of the first satellite of *Jupiter* at its transit 1890 September 8, by supposing the phenomenon to have been a close conjunction of the satellite with a small spot which he had seen three days earlier on the planet.

Leaving aside the fact that it is wholly improbable that two experienced observers should have been so mistaken in a matter of this kind, I would say that the phenomenon of apparent duplicity was watched for upwards of half an hour before the visitors interrupted (from before sidereal 18^h 30^m to about 19^h 7^m), part of which time Mr. Burnham observed with me. During that interval no relative motion was detected. At the transit of I, the relative motion of the satellite and a spot on *Jupiter* would have amounted to 0''.15 each minute of time—a displacement which would have been only too apparent in a few minutes with the 12-inch and the high magnifying power employed. It is, therefore, apparent that Mr. Williams's explanation can have no bearing on the apparent duplicity of Satellite I at its transit 1890 September 8.

I consider the observation of the double transit an important one, the explanation of which will perhaps be still more important.

It should be accepted as unquestionable that the phenomenon of 1890 September 8 was wholly connected with the satellite. One or the other of the two probable explanations which I have given in *Monthly Notices*, No. 9, vol. li., will doubtless be found in the end to be the true solution of the matter. It is unfortunate that the transits of this object still occur over a dark portion of *Jupiter*. As soon as these are transferred to a bright region we may expect to know something more definite.

The New Red Spot in the Southern Hemisphere.

The new red spot, which has been such a striking feature in the southern hemisphere of *Jupiter* during the past opposition, has disappeared. About the last of October it was the most prominent feature on the planet. It was well defined and of a clear red, very much resembling in distinctness and colour the appearance of the great red spot in 1880. In the first part of November it began to fade quite rapidly, and by the 20th was scarcely discernible.

On December 14 no trace of it could be made out with any certainty.

On November 20, 8^h 2^m.0, Mount Hamilton mean time, it was in transit, and its longitude was 110°.9.

The Great Red Spot.

This object seems again to be slackening its rate of rotation. During the past opposition its longitude remained quite constant at about 3°. Its longitude is now increasing. A transit on December 14, 5^h 5^m.3, gave the longitude = 6°.4. It is now very much more conspicuous than at opposition, and is a stronger red in colour.

Mount Hamilton :
1891 December 17.

Reappearance of Saturn's Ring, and Position Angle before the disappearance, observed at the Observatory, Utrecht. By Professor J. A. C. Oudemans.

The telescope of the Utrecht Observatory has an object-glass of Jacob Merz, aperture 0.260 metre; focal distance 3.200 metres. The eyepiece employed was a positive one of Steinheil, with a magnifying power of 162.

1891 October 28, 18^h, M. T., Utrecht. Hazy. *Saturn* decidedly without ring.

1891 October 29, 17^h 30^m. M. T., Utrecht. Clear. *Saturn* decidedly without ring. A thin dark line crosses the disc along the equator.

1891 October 30, 16^h-19^h. Overcast.

1891 October 31, 17^h 30^m. Clouds. *Saturn* visible for a moment; at both sides the ring is visible as a thin bright line.

1891 November 1, 17^h-19^h. Overcast.

1891 November 2, 17^h 15^m. M. T., Utrecht. Clear; a little hazy. Ring clearly visible; very beautiful, with the feeblest magnifying power 114. The dark line across the planet still visible. It seems to me that this dark line must be the dark ring.

I give these observations without comment, judging it better to wait for other observers' results.

After a careful discussion I adopted for the fourth edition of Kaiser's *Sterrenhemel* the following values of the dimensions of *Saturn* and his rings at the mean distance 9.53885 (see that Work, ii. p. 701):